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A MEASURE OF SELF-EFFICACY AMONG AGENCY DIRECTORS TO OFFER NUTRITION EDUCATION TO LOWCOUNTRY FOOD BANK CLIENTS

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ABSTRACT

In 2005, the Lowcountry Food Bank (LCFB) in Charleston, SC, launched an initiative to provide nutrition education to clients that seek food assistance. The agency directors of the 332 member agencies of the LCFB are in direct contact with clients, therefore they could provide nutrition education rather than the LCFB staff alone. As such, the self-efficacy of agency directors to deliver nutrition education must be measured. The objective of this project was to measure the self-efficacy of agency directors of the LCFB. A 17-item instrument measuring self-efficacy was developed, including ten validated items from the General Self-Efficacy Scale and an additional seven content-specific items. The instrument was piloted before and after a 45-minute nutrition education session to the LCFB 12-member Agency Council. The instrument was then mailed to all 332 agency directors, and 117 returned surveys (87 females and 30 males) were analyzed for correlations. There was no significant difference (P=0.490) in self-efficacy as measured by the GSE scale items between the males and females. Conversely, there was a significant difference (P=0.001) in self-efficacy between the males and females as measured by the content-specific items. Whether or not the respondents had nutrition training did not present significantly different (P=0.493) self-efficacy results on the GSE scale items; however, those respondents who had nutrition training responded with significantly more self-efficacy (P=0.002) on the content-specific items. There was no significant difference among the education levels and self-efficacy results. The LCFB will use these study results to develop strategies to help member agencies provide nutrition education to their clients.

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CHAPTER ONE

INTRODUCTION

In South Carolina, 18.3% of the population experiences some level of food insecurity despite the fact there are 2700 calories of food available per person per day in the United States (Nord et al., 2009; USDA Economic Research Service, 2009; USDA, 2002). Food insecurity is defined by Nord (2003) as when "the food intake of one or more household members was reduced and their eating patterns were disrupted at times during the year because the household lacked money and other resources for food." There has been an increase in daily calories consumed per person between 1970 and 2000, the ERS reports that the average calorie intake increased by 24.5%, roughly 530 calories per person (USDA, 2002). While Americans, including South Carolinians, have access to an adequate number of calories each day, research has suggested that there is an inappropriate distribution of the type of calories available, particularly to those who are food insecure. The least expensive foods are often the most calorie dense and nutrient poor (Darmon and Drewnowski, 2008; Drewnowski and Darmon, 2005; Drewnowski, 2009). Indeed, the majority of the increase in calories in the American diet is from grains (mostly refined) and fats and oils. These calories are from very inexpensive commodity crops, such as soybeans, wheat and corn. Among the food insecure, food choices are largely a matter of cost, taste and convenience (Drewnowski and Darmon, 2005). The food insecure population seeks food assistance to fill the void created by either a lack of access to enough food or a lack of money to purchase enough food.

At the state level, South Carolina takes advantage of programs to address food insecurity. The federal government offers nutrition assistance programs covering all ages of the food insecure population. These include The Special Supplemental Nutrition Program for Women, Infants and Children (WIC), Supplemental Nutrition Assistance Program (SNAP), the Afterschool Snack Program and Commodity Supplemental Food Program (CSFP). These programs are offered through state agencies, such as the South Carolina Department of Health and Environmental Control (SCDHEC) and the Department of Social Services, and at non-governmental organizations, such as food banks. For example, the USDA's Summer Food Service Program is administered by the South Carolina Department of Social Services and one of the sites at which it is offered is the LCFB.

The Feeding America Network is the nation's largest network of food banks with over 200 member food banks. The member food banks are reviewed regularly for compliance with their policies, which include food handling, storage practices, and distribution practices (Mabli et al., 2010a). Each food bank has a coverage area and distributes food and grocery products to charitable organizations within their coverage area. South Carolina has four main food banks in the Feeding America Network. Every county in South Carolina receives coverage by one of these four food banks. Food banks within the Feeding America Network accept corporate and individual food donations. Some purchase USDA commodity foods and others purchase foods from a national inventory available to food banks. Table 1.1 shows the food bank structure in South Carolina.

Table 1.1: Food bank structure in South Carolina			
Name	**Headquarters**	**Region**	**Counties**
Lowcountry Food Bank	Charleston, SC	10 coastal counties	Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Hampton, Horry, Jasper, Williamsburg
Golden Harvest Food Bank	Augusta, GA	11 Western counties	Abbeville, Allendale, Anderson, Bamberg, Barnwell, Edgefield, Greenwood, McCormick, Oconee, Pickens
Harvest Hope Food Bank	Columbia, SC	20 Central and Northeastern counties	Calhoun, Chester, Chesterfield, Clarendon, Darlington, Dillon, Fairfield, Florence, Greenville, Kershaw, Laurens, Lee, Lexington, Marion, Marlboro, Newberry, Orangeburg, Richland, Saluda, Sumter
Second Harvest Food Bank of Metrolina	Charlotte, NC	5 Northwestern counties	Cherokee, Lancaster, Spartanburg, Union, York

The Lowcountry Food Bank (LCFB) operates in Charleston, SC, serving the ten coastal counties of South Carolina through 332 member agencies currently. Member agencies include churches and other faith-based organizations as well as other non-profit organizations. These member agencies distribute food to LCFB clients in a variety of ways, including operating as food pantries, soup kitchens, or through mass distribution sites. According to 2010 census data, there are 1.28 million people in the ten counties served by the LCFB, of which approximately 15.7% experience food insecurity (Nord,

2003). The LCFB serves approximately 190,800 different people each year (Mabli et al., 2010b). Of these clients, 76% are non-Hispanic black, 20% are non-Hispanic white, and 2% are Hispanic (Mabli et al., 2010b).

The LCFB was established in 1983 to serve the needs of the hungry in its service area. There are approximately 35 full-time staff members who procure food, develop education/training programs, and coordinate distribution and agency services. The LCFB mission statement says "Our mission is to feed the poor and hungry of the ten coastal counties of South Carolina by soliciting and distributing healthy food and grocery products to nonprofit agencies serving the poor, and to educate the public about the problems of and solutions to domestic hunger." (www.lowcountryfoodbank.org) In addition to providing food to hungry people in the service area, the LCFB was compelled to be a more complete resource to the community by offering a higher level of service and launched a nutrition education initiative in 2005. One board member at the time, who is a Registered Dietitian, catalyzed this initiative. Thus, a definition for "healthy food" was developed to serve as a broad framework to guide the initiative. The board defined "healthy food" for donors and clients alike as "Healthy foods are fruits, vegetables, fish, lean meat and poultry, low-fat dairy products, whole grains and foods that do not contain an excessive amount of fat or caloric sweeteners." While no food donation is refused, the LCFB now actively requests healthy food donations per their definition, in order to increase the proportion of nutrient dense foods made available to LCFB clients. This definition also provides a framework within which the LCFB can manage its inventory and report healthy food distributions. This definition is not a

government or health organization policy definition. Their definition was not meant to designate that other foods are unhealthy or disallowed as donations, but rather, to support recipe development, procurement, and educational materials.

After they defined healthy food, they began to develop a nutrition initiative. To guide education outreach activities, they hired a nutrition educator. Initially, the nutrition educator's role was not clearly defined, because the LCFB had not identified the goal and objective of the nutrition education initiative. Hence, the nutrition educator focused more on cooking demonstrations both onsite at the LCFB and at agencies and at the community garden at the LCFB. Without having a clear goal and set of objectives, there was the possibility that the program would be ineffective. With only a broad job description for the position, there was the potential for too many incompletely developed program activities. Similarly, there were no protocols for measuring outcomes. Following the departure of that inaugural staff member, discussions centered on what the goal of nutrition education should be. Together with the LCFB Director and the Registered Dietitian board member, the newly hired nutrition educator used other approaches to reach the clients of the LCFB. There were multiple directions and priorities for nutrition education, but there were no established protocols for evaluating effectiveness of any of these initiatives.

Subsequently in June of 2010, a Nutrition Strategic Planning Committee was formed, and a Nutrition Strategic Plan was developed. The Committee recognized there was no information about client outcomes, because no standardized data collection procedure had been established and the LCFB staff has little direct contact with clients.

Given that the client is the target of the nutrition education for the LCFB, methods to better reach clients were discussed.

In the LCFB Nutrition Strategic Plan effective for 2011-2013, the roles and goals of the nutrition educator are clearly outlined. Some examples from the Strategic Plan include:

- Increase knowledge of LCFB Healthy Food among staff, board and agency managers.
- Increase percentage of "healthy food" distributed as percentage of LCFB total.
- Develop Nutrition Library in Benefit Bank.
- Develop and maintain a database of nutrition-related activities of LCFB partners throughout ten-county area. Data will be shared with clients and agencies by internet and other means.

The plan also includes a description of efforts to offer nutrition education to clients, such as:

- Assist agencies in the development of nutrition education programs appropriate for agency's clients.
- Produce "Eat Well, Be Well" print and on-line versions.
- Evaluate previous LCFB Nutrition Education Programs for effectiveness to reach the clients.

- Include "open-ended" items related to the usefulness of "Eat Well, Be Well" and other nutrition education programs/materials in site visit forms.

Since the nutrition education initiative was launched in 2005, nutrition education of LCFB clientele has had mixed results according to LCFB staff and anecdotal evidence from agency staff. Examples of activities that have been conducted include cooking demonstrations in the warehouses in Charleston, Myrtle Beach and Yemassee and nutrition spotlights in newsletters that are distributed to agencies and clients. Over time, it became evident that the LCFB needs to target agency directors as well, because the agency directors are the core of the LCFB. More importantly, they have direct contact with the clients so are more likely to catalyze change.

The LCFB has 332 member agencies, which provide direct service to the clients. Member agencies provide input and advice to the LCFB through the Agency Council, a twelve-member representative group of agency directors. One recommendation from the strategic planning process was to train agency directors to provide basic nutrition information to clients. A curriculum was piloted with the Agency Council on March 16, 2011. The nutrition curriculum will ideally increase the self-efficacy, or confidence, of the agency directors to provide nutrition education assistance to their clients. To develop the curriculum, methods of curriculum development were researched.

Anderson and Krathwohl (2001) developed an approach to curriculum development that centers around the Revised Bloom's Taxonomy (RBT), where curriculum development is focused on the processes of learning. The RBT considers

learning capacity of participants. This capacity, which is a result of proper delivery, is a prerequisite for behavior change. Proper delivery is a function of "perfectly aligned" objectives, content and learning activities (Anderson et al., 2001). The emphasis on alignment of objectives, content, and learning activities provides for a more accurate estimate of effectiveness and frames the lesson (Anderson, 2002). Using this alignment principle, emphasis was placed on the food groups of the USDA MyPyramid (now ChooseMyPlate) and the Nutrition Facts Panel. Before and after delivery of this pilot curriculum, a survey was administered measuring self-efficacy. The results were that there were no significant differences in the self-efficacy before and after participating in the curriculum. It is possible that the participants' perceived themselves as having high self-efficacy prior to the curriculum or that the curriculum is ineffective at enhancing self-efficacy. Both the pretest and posttest, Cronbach's Alpha coefficient values measuring internal consistency of the survey items are in the acceptable range. These values suggest that the instrument was acceptable for this purpose, and therefore it was used for the data collection of this report.

The goal of this project is to measure the self-efficacy of agency directors to provide nutrition education assistance to their clients. With a better understanding of the directors' self-efficacy, the Lowcountry Food Bank may use the results to develop effective nutrition education. The LCFB is committed to evolving and tuning their nutrition education programs and meeting the goals and objectives of the Nutrition Strategic Plan 2011-2013.

CHAPTER TWO

LITERATURE REVIEW

Nutrition in the U.S.

The nutritional status of Americans has changed dramatically since the middle of the 20th century. Obesity rates are on the rise; according to the Centers for Disease Control and Prevention (CDC), between 2000 and 2009, the number of people who were classified as obese increased by 6.9% to approximately 72.5 million people (Sherry et al., 2010). Obesity and its frequent comorbities, heart disease, stroke, diabetes, and several types of cancer results in health care costs of up to $147 billion annually in the US (Sherry et al., 2010). Health care expenses burden individuals, families, and the government in the case of Medicare or Medicaid patients. Expenses from doctors, prescriptions and medical treatments strap people and the government with large bills. Rappange et al. (2009) found that lifetime prescription costs are higher in obese individuals than healthy individuals even though life expectancy is reduced in obese individuals. There are also indirect costs associated with obesity, such as reduced income potential either from lost productivity or premature death (Sherry et al., 2010). The rising rates of obesity-related diseases and the associated health care costs suggest that Americans are suffering from the consequences of consuming too much energy. A shift in the U.S. lifestyle is a primary reason for the increasing number of Americans who are classified as obese.

The diets of Americans have changed over time. This reflects the "expanding food supply, aggressive food marketing, and changes in work and leisure patterns." (Kant

and Graubard, 2006). *The 2010 Dietary Guidelines for Americans* plainly states that there has been a dramatic change in the food supply over the last 40 years (USDA, 2010). Between 1970 and 2000, the Economic Research Service (ERS) reports that the average energy intake increased by 24.5%, roughly 530 calories per person. Grains, mostly refined grain products, and fats and oils account for 18.5 of the percentage points of that increased intake. The remaining sources of the increased intake are: added sugars; fruits and vegetables; meats and nuts; and dairy products and eggs (USDA, 2002). USDA offered more current data in 2010 and reported an increase of approximately 600 calories per person. This increased energy intake may be attributed to an overall increase in portion sizes (USDA, 2010). Kant and Graubard (2002) examined the results of the National Health and Nutrition Examination Surveys (NHANES) from 1971 to 2002. The results were an increase the quantity and energy density of food consumed, but not necessarily an increase in the frequency of eating. These increases parallel the increase in obesity in the U.S. as shown in Figure 2.1.

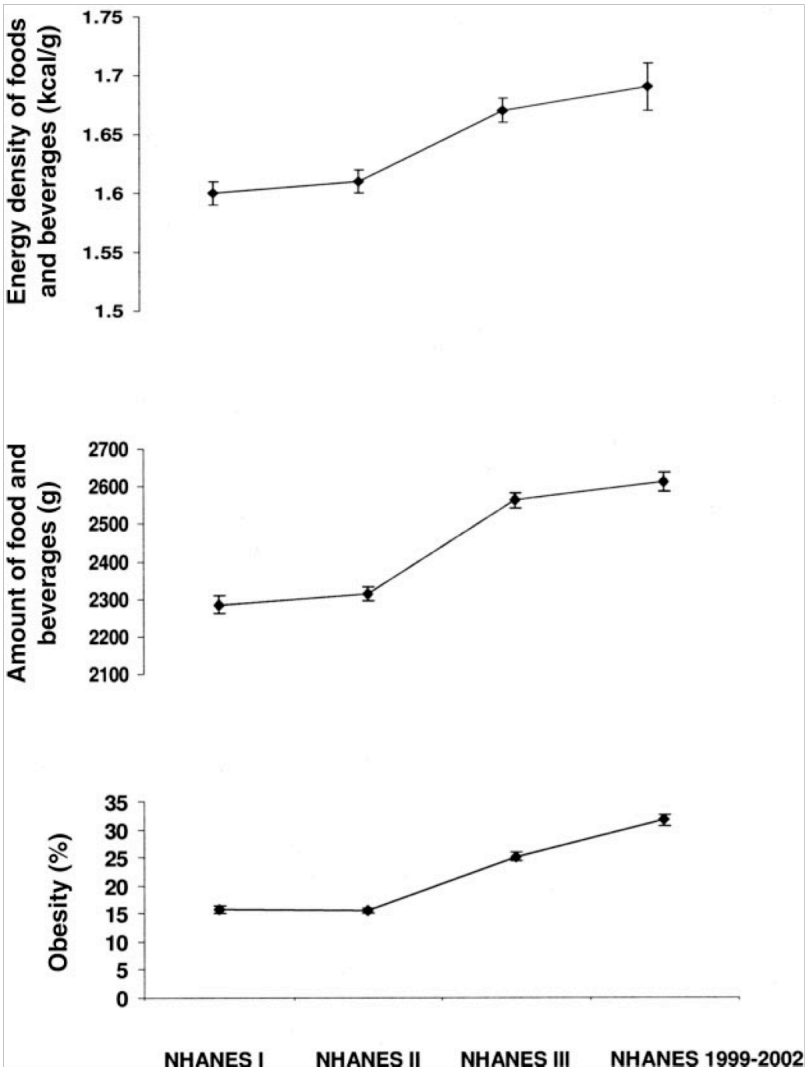

Figure 2.1: Trends in the energy density and quantity of foods consumed by Americans according to NHANES (Kant and Graubard, 2002).

The position of the USDA is that Americans eat too much fat, sugar, meats and refined grains and consume too few fruits, vegetables, whole grains, and dairy products (USDA and U.S. Department of Health and Human Services, 2010). Many fruits and vegetables are high in fiber, vitamins, and nutrients while also being low in energy;

therefore, they are nutrient-rich and low in energy. Foods high in fat, sugar, meats and refined grains tend to be higher in energy and lower in fiber; therefore, they are energy-dense. Consuming too many calories leads to weight gain, which over time can lead to obesity. Replacing higher calorie foods, such as foods high in fat or sugar, with fruits, vegetables and whole grains can lead to reduced energy intake and decrease risk of obesity.

Americans eat an estimated 0.9 cups of fruits and 1.7 cups of vegetables a day, less than the recommended amounts of 2 cups of fruits and 2.5 cups of vegetables per day (Wells and Buzby, 2008). Fruits and vegetables tend to be more expensive per calorie, so they are often passed over in favor of less expensive foods that provide more calories (Drewnowski and Darmon, 2005). Choices for less expensive foods include convenience foods, either packaged in stores or from quick-serve restaurants.

Other factors contribute to the shift in energy intake over time, in particular with the low-income population. Eikenberry and Smith (2004) conducted a study of 796 low-income subjects in Minnesota. They found that the most common barriers to healthy eating were time and cost. The time constraint referred to the time to prepare healthy foods as opposed to eating or heating prepared foods. Booth et al. (2001) took a comprehensive approach to examining environmental and societal factors that influence an individual's food choices and physical activity. The resulting network illustrates the complex and varied influences that interplay in food choices (Figure 2.3).

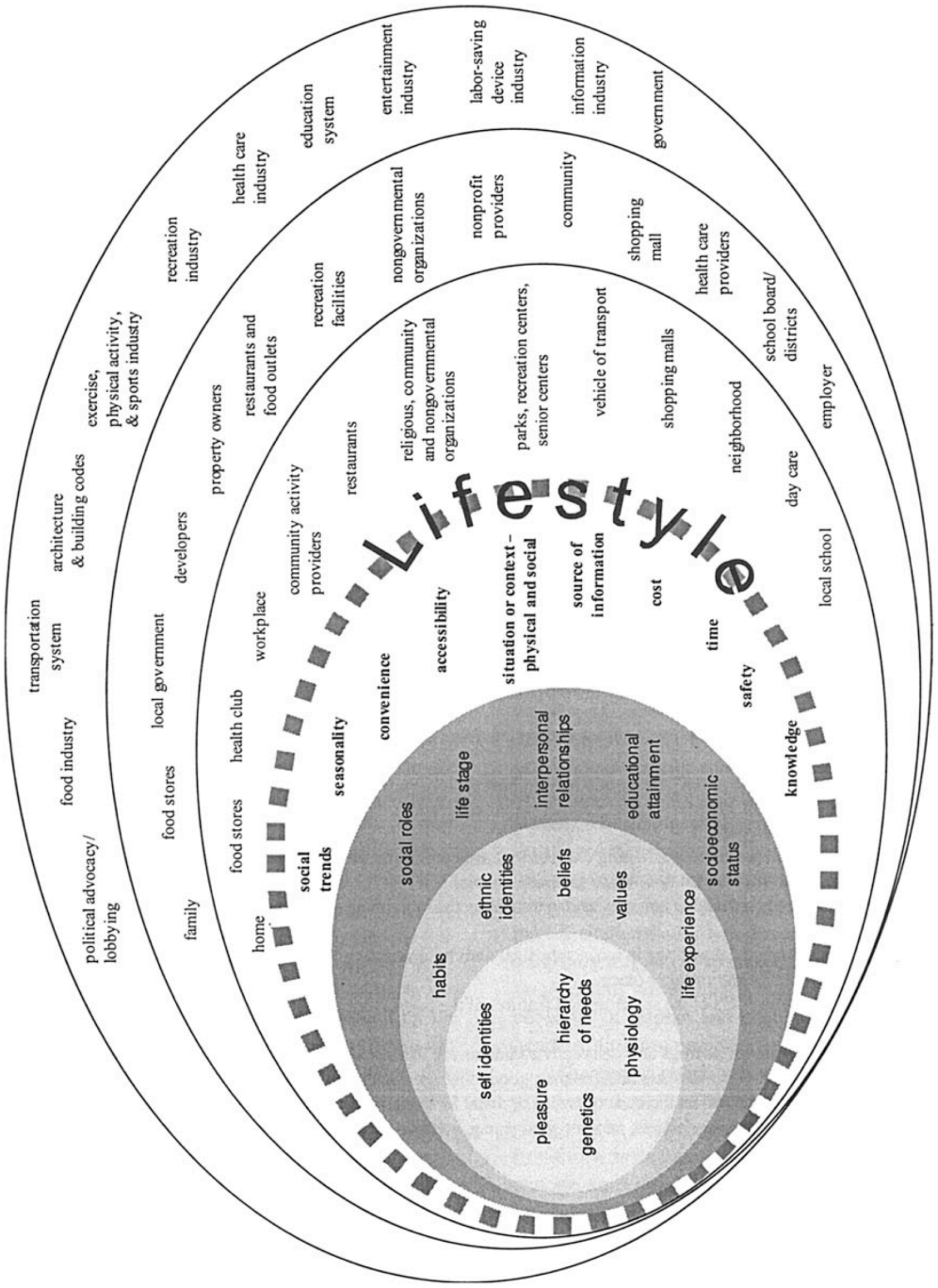

Figure 2.2: A framework of factors affecting nutrition and physical activity choices (Booth et al., 2001).

All of these points can disproportionately affect those who are food insecure. Food insecurity is defined by the USDA as "a condition that arises from a lack of enough income and other resources for food" (Wells and Buzby, 2008). The USDA monitors the food security of U.S. households using the Current Population Survey (Nord, 2003). Individuals and families may be forced to make food choices based on price, which may lead to higher intakes of energy-dense and nutrient-poor foods (Darmon and Drewnowski, 2008; Drewnowski and Darmon, 2005; Drewnowski, 2009). In addition to being less expensive, another characteristic of food choices of the food insecure is convenience (Lucan, Barg, and Long, 2010). Time constraints are an important consideration for low-income households, because they might have two working parents or be a single parent household. In a survey of 25 mothers and 25 fathers all of low to middle income, being a working parent generated what the authors referred to as coping strategies. The most common strategies included more than one meal per week from a quick-service restaurant and the use of prepared frozen or boxed entrées (Devine et al., 2009). Convenience foods are a necessity in many circumstances as a result of a lack of adequate choices, also known as food deserts (USDA Economic Research Service, 2009). Food deserts are defined as "areas with limited access to affordable and nutritious food" (USDA Economic Research Service, 2009). An estimated 2.3 million Americans who don't have a car live more than a mile from a supermarket (USDA Economic Research Service, 2009). The Economic Research Service (2009) also found that 23.5 million Americans living in low-income areas live more than a mile from a grocery store. A large portion of the food desert population are those living in poverty, who have limited

or no transportation, therefore they may only have access to convenience stores and restaurants. When developing nutrition education programs, the LCFB must consider the specific circumstances of their clients, such as transportation availability and reliance on convenience foods.

Food insecurity is positively correlated with incidence of overweight and obesity (Frongillo et al., 1997; Townsend et al., 2001; Peterman and Wilde, 2006; Olson, 1999; Lyons et al., 2008; Adams et al., 2003; Bansiotis and Lino, 2003; Hamelin et al., 1999). Adams et al. (2003) collected data from the California Women's Health Survey of 8169 women. They found that non-Hispanic white women who were food insecure without hunger were 36% more likely to be obese than non-Hispanic white women who were food secure. Similarly, women of other races were 1.5 times more likely to be obese if they were food insecure without hunger. Paradoxically, they were 2.8 times more likely to be obese if they were food insecure with hunger leading the authors to conclude that increased food insecurity increases the risk of obesity. Similarly, Peterman and Wilde (2006) reviewed data from the 1999-2000 and 2001-2002 NHANES and found that obesity and weight gain rates were highest among households experiencing intermediate food insecurity.

Published data explains that there is an abundance of inexpensive calories because of energy-dense nutrient-poor foods, the popularity of sugar-sweetened beverages and the prevalence of convenience and affordable restaurant foods (Kwan, 2009; Mercer, 2010). Within this overall environment, the food insecure or low-income populations are particularly vulnerable. Poverty is clearly linked with obesity and poor diet quality, as

demonstrated by the disproportionate increase in obesity and type 2 diabetes among those living in poverty (Darmon and Drewnowski, 2008; Drewnowski and Darmon, 2005; Drewnowski, 2009; Ver Ploeg et al., 2007; Champagne et al., 2007). Figure 1.1 illustrates the relationship between energy density and cost per calorie. The LCFB serves those experiencing food insecurity and poverty, and they want to play a positive role in the disproportionate food supply and rates of obesity among the food insecure.

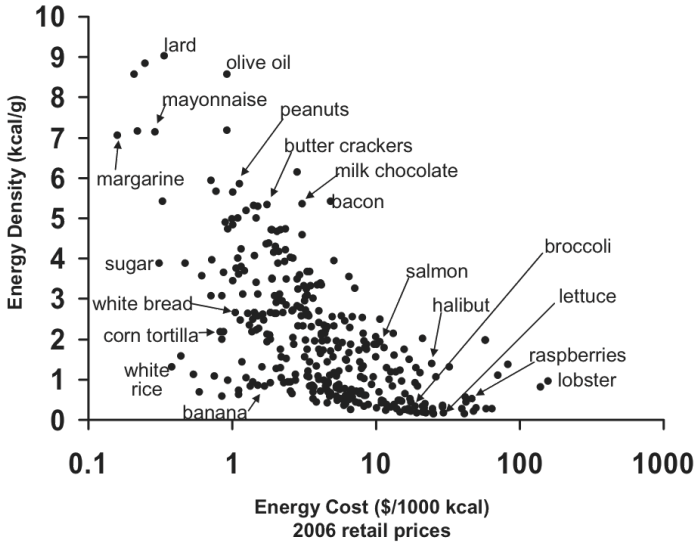

Figure 2.3: Relationship between energy density of selected foods (kcal/g) and energy costs (US$/1000kcal) (Drewnowski, 2009).

Food Banks

Food banks provide emergency food or food assistance to the nearly 1 in 6 Americans who experience food insecurity (Feeding America Network, 2011). The Feeding America network, with 200 member food banks, provides food assistance to

nearly 37 million Americans each year (Mabli et al., 2010a). Each food bank has member agencies that directly interact with the clients. Feeding America's Hunger in America Study 2010 reported that there are 33,500 food pantries, 4,500 soup kitchens and 3,600 emergency shelters in the U.S. (Mabli et al., 2010a). Limited published information is available regarding the demographic characteristics of the directors of participating member agencies of food banks. Duffy et al. (2006) presented information on 231 food pantry directors from Alabama and Mississippi. They reported that 37% of the directors were African American and 63% were white. Only 4% of the directors had less than a high school education, while 35% had some college education and 45% had a college degree or higher. With this limited information, statistics cannot be generalized for directors of LCFB member agencies.

While the primary mission of a food bank is to provide food assistance, in the nationwide report for the Feeding America Network, Mabli et al. (2010) found that 24.0% of member pantry programs, 34.4% of kitchen programs, and 39.4% of shelter programs provide some form of nutrition counseling. Roughly half of the member agencies in this report stated they needed assistance to adequately provide nutrition education to their clients.

SOURCES OF FOOD AND CHANNELS OF FOOD DISTRIBUTION FOR FOOD BANKS

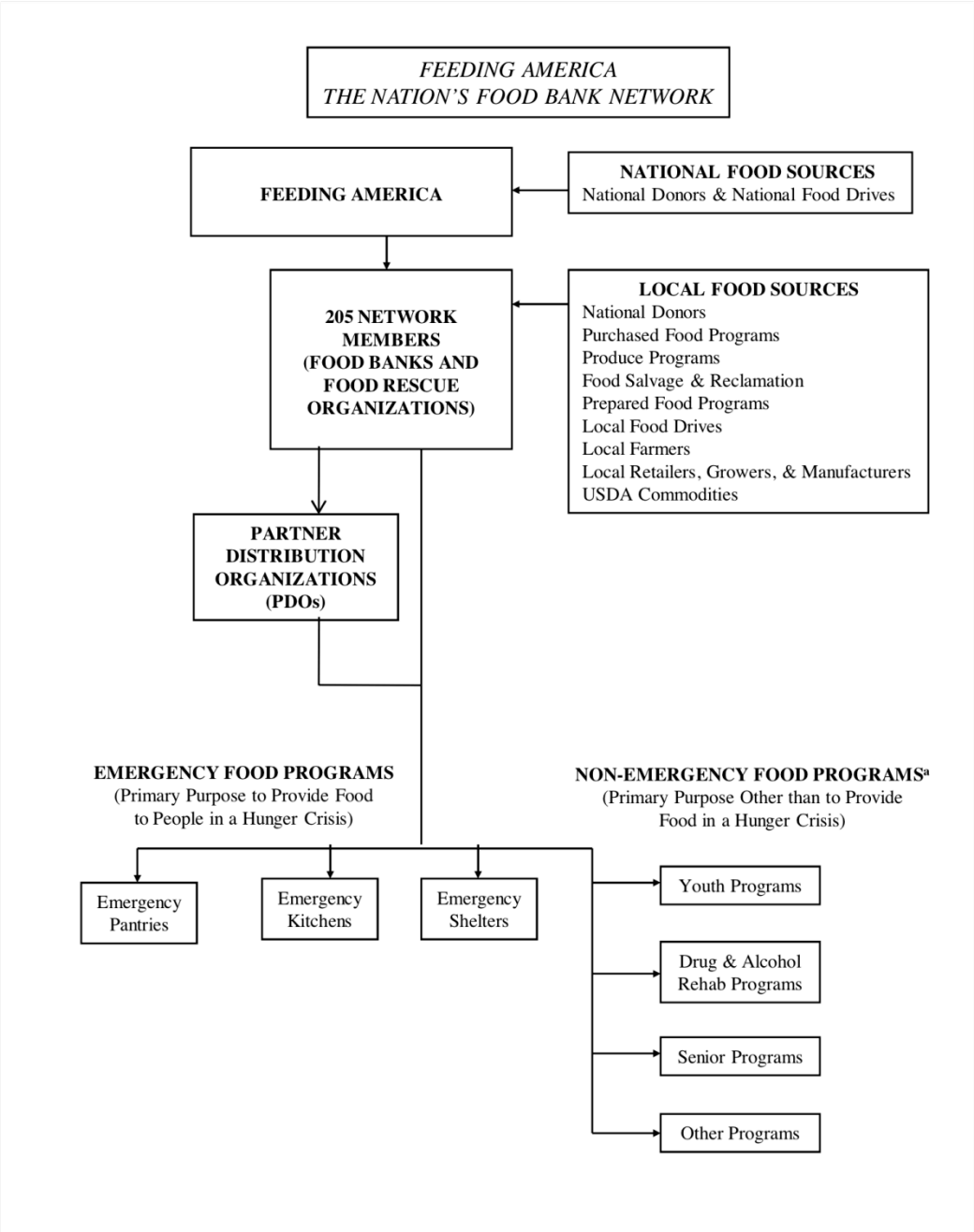

Figure 2.4: The structure of the Feeding America food bank model (Mabli et al., 2010a).

Nutrition Education at Food Banks

A variety of nutrition education programs occurring across the country are offered by different groups. One such program is Cooking Matters™, formerly known as Operation Frontline®, which is a cooking-based nutrition education program offered throughout the country in food banks and pantries. The program offers six weekly two-hour classes to teach participants how to prepare tasty low-cost meals with an emphasis on stretching food dollars (Share Our Strength, 2009). Classes may be targeted towards adults, families, teens, children or first-time parents. This program is offered in many states to as many as 11,000 families each year, according to the Cooking Matters™ website, http://cookingmatters.org/. Swindle et al. (2007) evaluated one program location for Operation Frontline® over the course of a 4-month data collection period. Of the 53 original participants, 27 completed the 3-month follow-up and 14 responded to the 6-month follow-up. The researchers report improved healthy behaviors as a result of the curriculum that was mostly maintained at three to six months. On a survey scale of 0-4, with 0 indicating never and 4 indicating almost always, the participants reported a 3.8 on hand washing and a 2.6 on eating breakfast as opposed to the pretest values of 2.8 and 1.1, respectively.

The Network for a Healthy California evaluated the provision of nutrition education within their network of food pantries, California Association of Food Banks (CAFB), and found that member agencies provide a range of nutrition information (McNally, 2009). One food bank offers a Nutrition Resource Center with education materials in multiple languages. Several food banks in the CAFB offer a Senior Brown

Bag Program that provides fresh fruits and vegetables to people age 60 and older. Most of the food banks in the CAFB participated in the Farm to Family Program that distributes gleaned produce at the food banks or through mobile distribution. Similarly, results of an Internet search, using the search term "nutrition education food banks", are that a variety of nutrition education programs are offered through food banks. For example, the New York City Food Bank offers a program called CookShop, which is very similar to Cooking Matters™ (http://www.foodbanknyc.org/go/our-programs/nutrition-and-health-education). The Greater Pittsburg Community Food Bank has developed a nutritional quality ranking system called Choosing Healthy Options (CHOP) to demonstrate a product's nutritional quality (www.pittsburghfoodbank.org/programs/nutrition.aspx). The West Texas Food Bank offers general nutrition education classes onsite covering topics such as food safety, cooking healthy tasty meals using food bank food products, and how healthy food contributes to their well-being (www.wtxfoodbank.org/programs/the_nutrition_education_program). Table 1.2 summarizes a sample of nutrition education programs offered in food banks across the U.S.

Table 2.1: Examples of nutrition education programs at U.S. food banks

Food Bank	Nutrition Education Program	Description	Results
Food Bank for New York City	CookShop	Program educating children, adults and families about making and choosing healthy meals	NYC Food Bank reports participants are more interest in healthful eating after attending (http://www.foodbanknyc.org/)
Greater Pittsburg Food Bank	Choosing Healthy Options (CHOP)	A ranking system that ranks food based on nutrient content.	Results are not known
Capital Area Food Bank	Recipe database	Staff chef created online database of recipes with healthy ingredients	Results are not known
Second Harvest Food Bank of California	Community Nutrition Program	Cooking demonstrations, multi-lingual nutrition, fitness, and wellness handouts, and in house resources from full time nutritionists	The Food Bank reports that participants report feeling healthier, increased fruit and vegetable consumption, and increased interest in healthy recipes
West Texas Food Bank	Nutrition Education Program	Hands-on classes covering the basics of nutrition, food safety and menu planning.	Results are not known
Rhode Island Community Food Bank	Raising the Bar on Nutrition	Workshops offering cooking demonstrations and nutrition education	Results are not known
Southeast Texas Food Bank	SNAP-Ed	Offering classes and food demonstrations based on materials from the USDA's SNAP-Ed	Results are not known

Table 2.1 continued: Examples of nutrition education programs at U.S. food banks

Oregon Food Bank	Cooking Matters™	Hand-on cooking and nutrition education classes	Cooking Matters™ website states that participants report improving their cooking skills and eating more fruits and vegetables (Cooking Matters Annual Review, 2009)
Capital Area Food Bank of Texas	CHOICES	Nutrition education classes covering basic nutrition, meal planning, cooking demonstrations, and wellness	Results are not known
Food Bank of Northern Nevada	Food Smarts	Hands-on cooking and nutrition education classes for children in Kids Café program	Results are not known
Food Bank of Western Massachusetts	Intergenerational Community Meals	Workshop for families, including the elders, adults and children covering basic nutrition and healthy cooking.	Results are not known

Nutrition Education Targeting Low-Income Participants

The nutrition education needs and the impact of nutrition education provided to food bank clients have been examined only on a limited basis. Hoisington et al. (2002) found that the most pertinent topics for food pantry clients in Oregon were: 1) shopping and stretching food dollars; 2) cooking and preparing tasty, low cost food; and 3) healthful foods and nutrition. Similarly, research conducted in Washington state shows

that pantry clients are most likely to attend nutrition education classes that focus on quick and easy recipes and low-cost meals (Wood et al., 2007). Dollahite et al. (2003) found an inverse impact of nutrition education on food insecurity. The study reviewed survey information from 15,846 Expanded Food and Nutrition Education Program (EFNEP) graduates in New York State. 80.2% of graduates were on food assistance at entry. The authors used a survey that ascertained the degree of food insecurity. The pre-education food insecurity score for the graduates was 2.44 and the post-education score was 2.06. This represented a statistically significant decrease in food insecurity. Reducing food insecurity is a primary goal of food banks such as the LCFB.

Findings on the short- and long-term effectiveness of nutrition education for low-income individuals and families are inconsistent. EFNEP, provided by the United States Department of Agriculture (USDA), aims to "assist limited resource audiences in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being." (www.nifa.usda.gov/nea/food/efnep/efnep.html). Nutrition education provided to food pantry clients through EFNEP reduced the need for food assistance and enhanced certain healthy behaviors regarding meals and family food practices, such as stretching food dollars throughout the month, lowering energy intake, increasing fiber intake, and increasing parental self-efficacy to model fruit and vegetable intake for children (Cullen et al., 2009; Dollahite et al., 2003). EFNEP provides nutrition education in sessions, which typically offer follow-up to participants. This setting is not directly comparable to

nutrition education provided through most food banks as the sessions tend to be hit or miss and there is limited follow-up. However, research conducted with EFNEP participants provides useful background information, because EFNEP serves clients that have limited resources and are likely to be receiving some form of government nutrition assistance. EFNEP employs a paraprofessional training model to facilitate the classes, thus avoiding the need for professional instructors. Because the LCFB has a single staff member dedicated to the Nutrition Strategic Plan, they plan to adopt a paraprofessional model for the agency directors.

EFNEP and the United Nations (UN) both have extensive peer training programs. EFNEP has had success with training paraprofessionals and volunteers to deliver nutrition education (Burney and Haughton, 2002; Murphy et al., 1980; Perez-Escamilla et al., 2008). The entire premise of EFNEP is to train paraprofessionals to deliver a professionally developed curriculum. Burney and Haughton (2002) report the successes of EFNEP's paraprofessional delivery in their study where they reviewed the EFNEP programs in 16 counties totaling 470 participants with a mean age of 31. These EFNEP participants reported spending less money on food, being more likely to extend their food dollars through the month, plan meals and improve nutrient intake than individuals who did not receive nutrition education. Perez-Escamilla et al. (2008) conducted a meta-analysis of the impact of nutrition education on Latinos in America. The review pointed out that food insecurity scores improved for Latino graduates of EFNEP consistent to the improvement shown by non-Latino participants.

The UN has an extensive training manual for peer training that is often referenced by organizations attempting to adopt this model (United Nations, 2003). The manual covers the definition and benefits of peer education, including credibility with participants. The manual then explains that the *"overall goal is to develop a recommended behaviour or to change risky behaviour in a target group"* (United Nations, 2003). Pointing out how various behavior theories contribute to peer education development, the UN training manual outlines guidelines for trainers regarding session content and the importance of the peer educator's credibility.

The government Food Stamp Nutrition Education (FSNE) program (now known as Supplemental Nutrition Assistance Program Education) has proposed core competencies for the paraprofessional nutrition educator that lead to more successful programs (Baker et al., 2009). These core competencies are meant to serve to identify good candidates to deliver nutrition education to FSNE participants. Educator qualities that increase the effectiveness of the FSNE program include the following core competencies:

- Understand the importance of the paraprofessional role in achieving program goals.
- Respect and value people's differences.
- Remain objective and avoid imposing one's own values on others.
- Meet the nutrition education needs of food stamp eligible learners of diverse race, ethnicity, gender, age, language, education level, sexual orientation, and disabilities.

- Schedule programs to be convenient for participants.
- Know community demographics, resources, needs, and issues.
- Be open to new ideas, concepts, and information (Baker et al., 2009).

Self-Efficacy

Self-efficacy is the "conviction that one can successfully execute the behavior required to produce the outcomes" (Rosenstock et al., 1988).

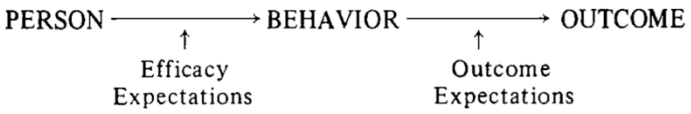

Figure 2.5: Influence of Self-Efficacy on Behavior Change (Bandura, 1977).

A person's self-efficacy is demonstrated to be a reliable predictor of healthful behavior changes including smoking cessation, weight loss, exercise frequency, and moderating alcohol consumption (Baldwin et al., 2006; Hofstetter et al., 1990; Oei and Burrow, 2000; Sallis et al., 1988; Strachan et al., 2005). Similarly, increasing a person's self-efficacy has been shown to elicit positive results in health behaviors (Dawson and Brawley, 2000; Haworth et al., 2009; Sallis et al., 1988; Sallis et al., 1999). Linde et al. (2006) determined that self-efficacy is a strong predictor of behavior change until the outcome is achieved, because self-efficacy is strongly linked with the initialization of a behavior change (Linde et al., 2006; Rothman et al., 2004). Self-efficacy is weakly associated

with maintaining the behavior change, as it might not be a question of ability to maintain the behavior as much as the desire to make the change (Linde et al., 2006). A limitation of measuring self-efficacy after exposure to an educational intervention is that it is not a measure of knowledge, so higher self-efficacy scores do not infer that a participant has more knowledge. The self-efficacy of the instructor or health education provider may play a role as well in the effectiveness of the education.

Self-efficacy of health educators impacts the effectiveness of the education. Lee and Ko (2009) studied the nursing performance of 1996 nurses in Korea. They reported that there was a strong correlation between the self-efficacy of the nurses and their performance (r=0.57, P<0.0001). Other studies focusing on health professionals promote bolstering self-efficacy of the professionals themselves, as they will in turn be more likely to promote healthy behaviors from their patients (Cabana et al., 2004; Thompson et al., 1993; Visser et al., 2008). Training teachers trained about nutrition topics increases the self-efficacy of those teachers to implement the curriculum (Fahlman et al., 2011; Britten and Lai, 1998; Stang et al., 1998). Fahlman et al. (2011) completed a study on the premise that instructor self-efficacy is "linked to teaching competence, curriculum implementation, and student outcomes." The study included 59 health education teachers who were invited to participate in a nutrition curriculum. Thirty teachers participated in the nutrition education session and 29 did not attend. The instrument employed measured the teachers' self-efficacy to teach nutrition education. The group that attended achieved significantly higher self-efficacy scores indicating a greater confidence to teach nutrition

education. Relative to this research, it is important for the LCFB to increase the self-efficacy of the agency directors for nutrition education reach the clients.

Lee and Bobko (1994) thoroughly outlined the commons methods to measure self-efficacy. The most common method is to use an instrument to ask participants to rate self-efficacy strength on a scale. This method is the selected method for this study. Another common method is to rate participants' self-efficacy magnitude. This is a sum of positive answer from yes or no items. Some studies use a combination of the strength method and magnitude method.

The General Self-Efficacy Scale (GSE) was developed by Schwarzer and Jerusalem in 1979 and has been shown to be acceptable for the general adult population (Chiu and Tsang, 2004; Luszczynska et al., 2005; Rimm and Jerusalem, 1999; Schwarzer and Jerusalem, 1995; Shi and Wang, 2005). Cronbach's alpha, a measure of reliability, for the GSE range from 0.76 to 0.90 (where 1.0 is the most reliable). Most of the values fall in the high 0.80's (Rimm and Jerusalem, 1999). Results of numerous correlation studies have demonstrated the validity of the GSE (Chiu and Tsang, 2004; Luszczynska et al., 2005; Rimm and Jerusalem, 1999; Schwarzer and Jerusalem, 1995; Shi and Wang, 2005). The GSE Scale is comprised of ten items that must be included in the testing instrument as shown in Table 1.1. Other items that are specific to the content being researched are to be interspersed among the 10 GSE Scale items (Schwarzer and Jerusalem, 1995).

Response Format: 1=Not at all true 2=Hardly true 3=Moderately true

4=Exactly true

1	I can always manage to solve difficult problems if I try hard enough.
2	If someone opposes me, I can find the means and ways to get what I want.
3	It is easy for me to stick to my aims and my goals.
4	I am confident that I could deal efficiently with unexpected events.
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.
6	I can solve most problems if I invest the necessary effort.
7	I can remain calm when facing difficulties because I can rely on my coping abilities.
8	When I am confronted with a problem, I can usually find several solutions
9	If I am in trouble, I can usually think of a solution.
10	I can usually handle whatever comes my way.

Table 2.2: General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995).

CHAPTER THREE

METHODS

Institutional Review Board Approval

Clemson University IRB approval was received on June 7, 2011 (IRB2011-169) to measure self-efficacy of agency director. The curriculum and instrument pilot portion of this study was approved under exempt status on March 14, 2011 (IRB2011-098).

Target Population

The LCFB has 332 member agencies. The directors (or contacts) of the agencies were the target population for this study. Of the listed agencies, it was determined there was agency overlap in two cases. There were two listings for the Boys and Girls Club with the same address and same contact. In this case, only one survey was mailed to this organization. There were three in-house "agencies" listed at the LCFB with the same contact and address, and only one survey was mailed in this case as well. Thus, the total number of surveys mailed was 329. The surveys were sent to the addresses on file with the LCFB. The directors were asked to complete the survey by July 7, 2011. All surveys that were returned and completed were included in the sample.

Instrument Development

A 17-item pretest/posttest instrument was created to measure self-efficacy. The instrument was based on the ten-item General Self-Efficacy (GSE) scale (Schwarzer and Jerusalem, 1995). An additional seven content-specific items taken from the curriculum were also prepared (Appendices D and E). The validity and reliability of the GSE scale

had been well tested. Multicultural validation had been demonstrated for the GSE scale (Luszczynska et al., 2005). The additional seven content-specific items were derived from the curriculum outline. The content-specific items were as follows: two items measured the content domain "Food Groups and Balanced Meals"; three items measured "Label Reading"; one item measured "Incorporating Fruits and Vegetables throughout the Day"; and one item measured "Resources to Share with Clients." The curriculum is in Appendix C. The 17-item instrument was piloted at an Agency Council meeting in March 2011.

Of the twelve participants who make up the Agency Council, eight attended the meeting in March 2011. Of those in attendance, six returned the posttest survey. The pretest was administered upon arrival, and approximately 20 minutes later, the curriculum was presented. The curriculum took 45 minutes to complete, after which the participants could complete and return the posttest survey onsite or mail it in self-addressed stamped envelopes that were provided. Overall, there was not a statistically significant change between the pre- and posttest item scores. This suggested that the high scores on the pretest left little to no room to increase scores. One possible explanation for this is that participants had adequate self-efficacy before exposure to the curriculum, because they themselves were confident about the nutrition knowledge they possessed. However, the pilot participants did state that they enjoyed the topics and that this curriculum would be useful for all agency directors.

Self-efficacy was then measured of all 332 agency directors in June 2011 (Appendix F). In order to evaluate whether self-efficacy results were impacted by

demographic data, the survey mailed to all agency directors included items to determine age, gender, level of education, years of service to the LCFB, formal nutrition training, and whether they, as a director, have direct contact with clients. The survey was estimated to take 15 minutes to complete.

Data Collection

Mailing addresses for the target population (agency directors) was provided by the LCFB. A survey, an informational letter, and a self-addressed stamped envelope were mailed on June 14, 2011 using the U.S. Postal Service (Appendix E). The informational letter stated that participation was voluntary and that a returned survey indicated consent to participate. The participants were informed there were no risks involved in participating in this study, but the benefits of participating included assisting the LCFB with the development of nutrition education for food bank clients.

Each survey was assigned an identification number so non-respondents could be tracked for the follow-up mailing. No reference would be made in oral or written reports that could link the names of the respondents to the study. All surveys that were returned with no errors or omissions were included in the sample. Surveys were mailed a second time, 23 days after the first mailing, to the agencies that had not responded by July 7, 2011.

To increase the response rate, the LCFB included a description of the study in a mass email that it sends to all of its member agencies once a week. At the onset of the data collection, a message was included in the weekly email on June 16, 2011, (the week

the agencies were to receive the surveys) that the survey would be arriving and encouraging participation on the basis that it would greatly assist the LCFB to better serve its clients. This message was repeated in three subsequent emails on June 21, 2011; June 29, 2011; and July 10, 2011.

Data Entry

Three undergraduate research assistants, who have completed Collaborative IRM Training Initiative (CITI) human subjects training, entered the survey responses into an Excel spreadsheet, which was imported to SAS. A randomized sample check using Excel's random selection was performed on 10% of the survey data to check that data had been correctly entered. To ensure privacy, hard copies of returned surveys were stored in a locked cabinet and the data set was stored in the research assistants' office. Additionally, all potentially identifiable data were scheduled to be destroyed at the completion of the study.

Statistical Analysis

The data were analyzed for internal consistency as shown in Table 3.1. Cronbach's alpha coefficient is typically used in self-report inventories. Cronbach's alpha estimates how well the items are working in a scale. Scale alphas of 0.69 are acceptable for pilot studies; alphas of 0.90 indicate a high level of internal consistency. The closer the alpha coefficient is to 0.90, the more reliable the scale score estimates (Streiner and Norman, 1989). To analyze the data for trends among demographic characteristics, a P-value of <0.05 was considered significant. Wilcoxon Rank-Sum Test and Kruskal-Wallis variance analysis tests were performed for the predictor analysis. All data analyses were performed using SAS (version 9.2; SAS Institute, Inc.; Cary, NC, 2008).

Table 3.1: Statistical analysis

	Variables	**Analyses**
Descriptive statistics	Mean, standard deviation	SAS to compute measures of central tendency
Reliability of instrument	Coefficient of reliability	Cronbach's Alpha
Predictors	P-Value, Pr > Chi-square	Wilcoxon Rank-Sum Test, Kruskal-Wallis variance analysis

CHAPTER FOUR

RESULTS AND DISCUSSION

Pilot Testing of Instrument

When the curriculum was delivered on March 16, 2011, eight of the 12 Lowcountry Food Bank Agency Council members attended. Of those in attendance, six completed the posttest survey. Table 4.1 shows the pre- and posttest mean scores, standard deviations, and variances for each of the 17 self-efficacy items that comprised the pre- and posttest survey. Cronbach's alpha, a coefficient of reliability, was also calculated to determine the internal consistency of the instrument items as a scale to measure self-efficacy.

Overall, there was no significant difference between the pretest and posttest item mean scores suggesting that the pilot test group already had a high level of self-efficacy. This was to be expected as the respondents comprised the 12-member council, which represents the 332 member agencies, so are more likely to be confident leaders.

Both the pretest and posttest Cronbach's alpha coefficient values were in the acceptable range, indicating internal consistency between all 17 items. The pretest Cronbach's alpha coefficient was 0.8, and the posttest value was 0.9 as shown in Table 4.1. Scale alpha coefficients of 0.69 are acceptable for pilot studies. An alpha coefficient of at least 0.90 indicates a high level of internal consistency of the scale items.

Upon completion of the pilot, it was recognized that one limitation of the pilot test instrument was there were no items to assess the demographic characteristics of each respondent. A series of items assessing demographic characteristics were added.

Because the Cronbach's alpha coefficients were high (>0.8), none of the 17 self-efficacy items were modified.

On April 5, 2022, telephone follow-up interviews were attempted with all 12-members of the LCFB Agency Council. Interviews were successfully completed with five members. The interview questions were as follows:

1. Did you think the training was useful to agency directors?
2. What are the challenges for agency directors to attend training like this?
3. What are the benefits for agency directors to attend training like this?
4. Is this type of training beneficial for clients?
5. What incentives would make training like this more attractive?
6. Would you recommend this training to other agency directors?

The summary of the directors' comments is shown in Table 4.2.

Table 4.1: The pilot pre- and post-testing response means and standard deviations of the March 16, 2011 curriculum presentation

		Mean		SD		Variance	
		Pre	Post	Pre	Post	Pre	Post
General Self-Efficacy Questions							
1	I can always manage to solve difficult problems if I try hard enough.	3	4	1.0	0.5	1.1	0.3
2	If someone opposes me, I can find the means and ways to get what I want.	3	3	0.9	0.4	0.8	0.2
3	It is easy for me to stick to my aims and my goals.	3	3	0.7	0.5	0.5	0.3
6	I am confident that I could deal efficiently with unexpected events.	4	3	0.5	0.5	0.3	0.3
8	Thanks to my resourcefulness, I know how to handle unforeseen situations.	4	3	0.5	0.4	0.3	0.2
11	I can solve most problems if I invest the necessary effort.	5	4	0.4	0.4	0.1	0.2
12	I can remain calm when facing difficulties because I can rely on my coping abilities.	5	4	0.5	0.5	0.2	0.3
13	When I am confronted with a problem, I can usually find several solutions	5	4	0.5	0.5	0.3	0.3
15	If I am in trouble, I can usually think of a solution.	5	4	0.5	0.5	0.3	0.3
17	I can usually handle whatever comes my	5	4	0.8	0.5	0.3	0.3
Content-Specific Questions							
4	I can explain the concept of food groups to a LCFB client.	3	4	0.7	0.5	0.5	0.3
5	I can explain what a balanced meal is to a LCFB client.	4	4	0.5	0.4	0.3	0.2
7	I can suggest recipes to LCFB clients using pantry items as ingredients.	4	4	0.5	0.4	0.2	0.2
9	I can explain the concept of a serving size to a LCFB client.	4	4	0.9	0.4	0.8	0.2
10	I can explain to a LCFB client what a serving of protein looks like.	4	4	0.7	0.4	0.6	0.2
14	I can explain the calories per serving on the Nutrition Facts Panel to an LCFB client.	4	4	1.0	0.4	1.0	0.2
16	I can suggest ways LCFB clients can incorporate vegetables into their day's meals.	5	4	0.5	0.4	0.2	0.2
			Variance of the total scores			32.6	24.4

Cronbach's Alpha for Pre-Survey = 0.8
Cronbach's Alpha for Post-Survey = 0.9

Table 4.2: Summary of telephone interview results

Director	Question	Comments
1	1	Yes, this training is useful to agency directors.
	3	Stated that the benefits include increased ability of directors to educate clients about healthy eating and the benefit of take-home materials.
	3	This director emphasized that the agency's goal is to develop a good relationship with the clients and not just provide food.
	4	This director was particularly motivated to assist clients because so many of the agency's clients were burdened with health issues.
2	1	Yes, this training is useful to agency directors.
	3	This director was eager to provide a greater service to the clients
	4	"The more we know about nutrition, the better it is for our clients."
3	1	Yes, this training is useful to agency directors.
	2	This director suggested that directors are pressed for time and the 45-minute session was agreeable.
	3	This director reported that the curriculum presentation covered appropriate material for the directors' use with clients and was conducted over an appropriate length of time.
4	1	Yes, this training is useful to agency directors.
	2	Some directors are unmotivated.
	3	The curriculum gave good information, such as how to prepare dishes and recipes.
	4	This directors hears clients that are diabetic asking for nutritious foods and recipes.
	5	It was incentive enough for this director to be able to provide more client service.
5	1	This director did not think this type of training would apply to that particular agency.
	5	This director suggested placing the curriculum in a presentation or video format and let agency directors review
	6	While the training is useful, it is not necessary.

Measure Self-Efficacy of Agency Directors

On June 14, 2011, 329 surveys were mailed to all agency contacts. Twenty-three (23) days later on July 7, 2011, 231 surveys were mailed to all non-responders. Respondents were asked to complete the survey by July 31, 2011. The agency directors themselves are from various backgrounds. There is no education requirement or set of skills required to be a member agency or agency director. The majority of the directors are females between 40 and 70 years old and either African American or white, with very few of any other ethnicity.

A total of 123 surveys were returned for a response rate of 37.4%. Six were not usable because of incomplete demographic data and were eliminated from the sample. A total of 117 surveys were analyzed. Some assumptions were made about the remaining returned surveys. If a respondent indicated less than a year of service to the LCFB, a value of one year was used for data analysis. Similarly, some participants handwrote on the survey a degree higher than an undergraduate degree. For these cases, the information was coded as college graduates, as the instrument did not have an item to assess the number of respondents who had earned advanced degrees.

Eighty-seven (87) (74.4%) of the respondents were females and 30 (25.6%) males. The female respondents had a mean age of 55 years and had worked with the LCFB for an average of 7.1 years. The male respondents had a mean age of 60 years and had worked with the LCFB for an average of 5.9 years. Nearly all (n=110; 94%) of the respondents reported that they had direct contact with LCFB clients. These findings supported the rationale for this study--agency directors themselves and not LCFB staff

are the best conduit to the LCFB clients. Most respondents (n=69; 59%) indicated they had not received any nutrition training. The definition of nutrition training was not specified on the survey. The majority (n=57; 48.7%) of the respondents were college graduates, followed by respondents reporting some college coursework (n=37; 31.6%) then high school graduates (n=19; 16.2%). Only 4 (3.4%) respondents had not graduated high school.

The survey was separated into two scales—GSE and content-specific. Cronbach's alpha coefficients calculated for both were acceptable indicating internal reliability of the two scales—GSE scale (0.86) and the seven content-specific items (0.92). The reason that Cronbach's alpha coefficients were calculated separately for the GSE scale (10 items) and the content-specific items (7 items) was because the reliability of the GSE scale items had been determined (Schwarzer and Jerusalem, 1995), whereas item analysis of the content-specific items had not been performed so the validity and reliability of the items was not known.

A four-point Likert scale response format was used to measure agreement with all items, where 1=not at all true; 2=hardly true; 3=moderately true; and 4=exactly true. A response choice of 4 represented the highest level of agreement for that item so would indicate the highest level of self-efficacy. The mean score for the GSE scale was 3.5 (SD ± 0.6). The mean score for the content-specific scale was 3.3 (SD ± 0.6) as shown in Table 4.4. Both scores were determined to represent a high level of self-efficacy.

These two findings were not unexpected. Agency directors of the LCFB work largely in a volunteer capacity with very few directors in paid or well-paid positions.

Midlarsky (1991) stated that one of the five main benefits of altruism was an increased self-efficacy. It may be that individuals who volunteer their time, as agency directors commonly do, exhibit higher general self-efficacy. These altruistic individuals have also been shown to report higher levels of happiness and improved health (Post, 2005).

There was no significant difference (P=0.490) in general and content-specific self-efficacy between males (3.4 ± 0.4) and females (3.4 ± 0.6) as shown in Table 4.4. Conversely, there was a significant difference (P=0.001) in self-efficacy between males (3.0 ± 0.6) and females (3.4 ± 0.6) as measured by the content-specific scale. The reason for this difference is presumably because women are more typically the grocery shoppers and meal planners in the household so we believe would naturally have more experience with food-related issues, such as nutrition. Additionally, women gravitate towards careers in health care (U.S. Department of Labor, 2009), therefore, they might have more exposure to nutrition topics. Another possible source of nutrition exposure for women is motherhood, as they might receive nutrition education from a variety of sources during prenatal and pediatric care. Men, on the other hand, are not as commonly in a care-giver position and may not have as much exposure to nutrition topics.

The results were similar for the correlation analysis of nutrition training of the respondents (Table 4.4). Respondents who had not had nutrition training (3.5 ± 0.4) did not have significantly different GSE mean scores (P=0.493) from those who had training (3.5 ± 0.4). However, those respondents who had nutrition training (3.5 ± 0.6) showed significantly higher mean scores (P=0.002) on the content-specific scale in comparison with those who had reported no training (3.2 ± 0.7). These results are similar to findings

about nutrition educators reported by Fahlman et al., 2011; Britten and Lai, 1998; and Stang et al., 1998. Fahlman et al. (2011) divided 59 6-12 grade teachers into 2 groups; one received nutrition education and one did not. The group that received nutrition education had higher self-efficacy to offer nutrition education to their students. Stang et al. (1998) in a large sample of 1890 Minnesota public school teachers found that teachers with previous training in nutrition were more likely to teach nutrition than those without training. Furthermore, teachers who had taken a college course in nutrition were more likely to teach more than 10 hours of nutrition per year

This is a key finding for this study, as the intent of the LCFB is to provide nutrition education training to agency directors so that they will in turn provide LCFB clients with nutrition education. These results indicate that if the LCFB provides nutrition training through a standard curriculum to agency directors, they may be more likely to provide nutrition education assistance to LCFB clients. The goal of nutrition education at the LCFB is to have a positive impact on their clients, so as to provide a greater community service to their clients than calories alone.

The data were also analyzed to determine the correlation between education level and self-efficacy (Table 4.5). Using the Kruskal-Wallis analysis, values for Pr > Chi-square were calculated. For this analysis, if a value of Pr > Chi-square is equal to or less than 0.05, the Least Significant Difference (LSD) analysis would be performed. The results for the GSE scale and content-specific items were Pr > Chi-square=0.147 and Pr > Chi-square=0.107 respectively. These values indicate no significant difference exists between education levels and self-efficacy results, thus an LSD analysis was not

performed. Education level does not correlate with the self-efficacy results for this survey. Given that the education levels of the LCFB agency directors are diverse, it is useful to know that education level will not be a barrier to providing nutrition education to clients as it is not correlated with levels of self-efficacy.

Table 4.3: Self-efficacy survey means, standard deviations, and Cornbach's alpha

		Mean	Standard Deviation	Cronbach's Alpha
General Self-Efficacy Questions		3.5	0.6	0.86
1	I can always manage to solve difficult problems if I try hard enough.	3.6	0.5	
2	If someone opposes me, I can find the means and ways to get what I want.	2.8	0.8	
3	It is easy for me to stick to my aims and my goals.	3.5	0.5	
6	I am confident that I could deal efficiently with unexpected events.	3.6	0.5	
8	Thanks to my resourcefulness, I know how to handle unforeseen situations.	3.5	0.6	
11	I can solve most problems if I invest the necessary effort.	3.6	0.5	
12	I can remain calm when facing difficulties because I can rely on my coping abilities.	3.6	0.6	
13	When I am confronted with a problem, I can usually find several solutions	3.6	0.5	
15	If I am in trouble, I can usually think of a solution.	3.5	0.5	
17	I can usually handle whatever comes my way.	3.6	0.5	
Content-Specific Questions		3.3	0.8	0.92
4	I can explain the concept of food groups to a LCFB client.	3.3	0.7	
5	I can explain what a balanced meal is to a LCFB client.	3.5	0.6	
7	I can suggest recipes to LCFB clients using pantry items as ingredients.	3.2	0.9	
9	I can explain the concept of a serving size to a LCFB client.	3.3	0.8	
10	I can explain to a LCFB client what a serving of protein looks like.	3.3	0.8	
14	I can explain the calories per serving on the Nutrition Facts Panel to an LCFB client.	3.1	0.8	
16	I can suggest ways LCFB clients can incorporate vegetables into their day's meals.	3.5	0.7	

Table 4.4: Results of sample, gender and nutrition training

Characteristics	*N* (%)	GSE scale questions Mean ± SD	*P* value*	Content-specific questions Mean ± SD	*P* value*
Total	117 (100)	3.5 ± 0.6		3.3 ± 0.8	
Gender			0.490		0.001
Male	30 (25.6)	3.4 ± 0.4		3.0 ± 0.6	
Female	87 (74.4)	3.4 ± 0.4		3.4 ± 0.6	
Nutrition training			0.493		0.002
No	69 (59.0)	3.5 ± 0.4		3.2 ± 0.7	
Yes	48 (41.0)	3.5 ± 0.4		3.5 ± 0.6	

* *P*- value is for differences between characteristics, $P < 0.05$ is significant

Table 4.5: Results of sample, education level

Characteristics	*N* (%)	GSE scale questions Mean ± SD	Kruskal - Wallis Test results* *Pr* > Chi-square	Content-specific Mean ± SD	Kruskal - Wallis Test results* *Pr* > Chi-square
Total	117 (100)	3.5 ± 0.6		3.3 ± 0.8	
Education level					
Some grade	4 (3.4)	3.3 ± 0.7		3.2 ± 0.7	
High school graduate	19 (16.2)	3.4 ± 0.4	0.147	3.1 ± 0.6	0.107
Some college	37 (31.6)	3.4 ± 0.4		3.3 ± 0.6	
College	57 (48.7)	3.6 ± 0.4		3.4 ± 0.6	

* If *Pr* > Chi-square = 0.05 or less then a significant difference exists between one or more groups

Limitations of the Study

This study was limited by several factors. The delivery of the curriculum to the 12-member agency council presentation was scheduled by the LCFB as part of the monthly meeting agenda. Each month, there are one or more members who are not able to attend. For the March 2011 meeting, 8 of 12 members attended. Because

demographic data was not collected, we were not able to ascertain if the absence of the four members affected the pilot test results.

Additionally, due to time constraints and the schedules of those involved, only one 45-minute curriculum presentation was conducted. The curriculum could be presented to all available agency directors at once or over a series of sessions. If this were a stand-alone session, then perhaps the time constraints would not be a limitation. The opportunity to present the curriculum to additional agency members would presumably have provided more information and better pretest data. Also, there were no incentives available or a budget for supplies or materials for the delivery of the educational intervention. While the directors who participated in the telephone interviews did not think incentives were necessary, incentives would presumably increase participation.

Analyses of the self-efficacy among agency directors was limited by several factors. While the content-specific items are tightly aligned with the curriculum objectives in accordance with Revised Bloom's Taxonomy, item analysis was not performed on the content-specific items prior to administering the instrument to all 332 agency directors. The GSE Scale was documented to be valid and reliable (Schwarzer and Jerusalem, 1995). Item analysis of the content-specific items should have been determined prior to administration of the instrument to the target population. To compensate for this, the two scales were analyzed separately. Exploratory and confirmatory factor analysis as described by Brenowitz and Tuttle (2003) should also

have been run on the content-specific items. However, the pilot sample was too small to conclusively determine validity and reliability of the content-specific instrument items.

Additionally, there were time constraints during the data collection. Best practices for surveys recommends three mailings to achieve the best response rate. In this study, we only sent out two mailings yielding a response rate of 37.4% as there was not sufficient time for a third mailing.

This study targets the LCFB and its member agencies. Thus, the results are not generalizable to other food banks and their agencies. However, the findings reported regarding the development, execution and results from this study can be used to guide nutrition education studies conducted with food banks.

CHAPTER FIVE

CONCLUSIONS

The pilot portion of this study reports an accounting of the development of a nutrition education curriculum targeting LCFB member agency directors and its delivery. The intent of the curriculum was to increase agency director self-efficacy. It was hypothesized that if self-efficacy was high, then agency directors were more likely to provide nutrition assistance to the clients of the LCFB.

The 45-minute nutrition education curriculum was developed in accordance with the principles of Revised Bloom's Taxonomy. The self-efficacy measurement instrument that was administered pre- and post exposure to the curriculum was based on a GSE scale (10 items) and an additional seven content-specific items.

Follow-up telephone interviews were also conducted with five of the 12 members of the Agency Council. Responses were very positive responses, with directors stating support for this time of nutrition education and that they would recommend it to other directors. Directors also stated that they strive to provide necessary assistance to clients not limited to meals alone.

Upon completion of the pilot, an instrument was administered to all 332 agency directors to measure their self-efficacy. This was in order to develop a more comprehensive understanding of the self-efficacy of agency directors, including the relationship of self-efficacy to gender, education level and nutrition background. The results of the 117 completed surveys showed a significant difference in mean scores between men and women with regard to the content-specific self-efficacy items. The

content-specific questions, which related directly to the curriculum, measured self-efficacy of the nutrition topics in the curriculum.

An analysis of the survey results showed that women exhibited higher self-efficacy on the content-specific nutrition topics. Perhaps women are more exposed to nutrition topics because of maternal experience or health care careers, or maybe women are simply more confident in their nutrition knowledge. Similarly, the results suggest that agency directors who have received some sort of nutrition education have higher levels of self-efficacy about delivering nutrition education. These results were similar to findings by Fahlman et al., 2011; Britten and Lai, 1998; and Stang et al., 1998. We believe that those who have received nutrition education in the past would naturally feel more confident about the subject. The LCFB could benefit from nutrition education to agency directors, because as these results suggest, they will have higher levels of self-efficacy to offer nutrition education to LCFB clients.

Future Work

In the words of one of the directors, "When we give anything positive to the community, then we have done our job and it is not in vain; even if we help just one person." Thus, the results of this study do support further research and implementation of a nutrition education curriculum for agency directors at the Lowcountry Food Bank. The telephone interview provided valuable perspective from the participating agency directors that this type of curriculum would enhance their service to LCFB clients. If nutrition education is offered to agency directors in the future, it is important to measure the effect

of this education on efforts to reach the end user (the LCFB clients). After all, the goal is to reach LCFB clients with nutrition education so they can better manage their food choices and food consumption. If we do not measure this, we have not accomplished our goal.

Future research questions could include how is the curriculum information used, if at all, by the agency directors. What assistance is actually provided to the clients? How useful do the clients find the information to be? Answers to these questions could continue to improve the efficacy of nutrition education activities offered through food banks. Also, future research could examine the self-efficacy of agency directors nationwide to compare with the results of LCFB agency directors. What regional differences, if any, are there? Are there differences among agency directors of food banks that offer nutrition education and those that do not? The results of this study suggest that further research could lead to more effective nutrition education to clients of food banks.

APPENDICES

Appendix A: Pilot Informed Consent Letter for Pre- and Posttest

Information for Participation in a Research Study
Clemson University

Assessment of self-efficacy among Agency Directors of offering nutrition assistance to Lowcountry Food Bank clients

You are invited to participate in a research study conducted by Dr. Beth Kunkel along with Lucie Maguire. The purpose of this research is to further understand the level of self-efficacy of Agency Directors to offer nutrition assistance to Lowcountry Food Bank (LCFB) clients.

Your participation will involve filling out a survey about ability to offer nutrition assistance to LCFB clients. This survey will take approximately 15 minutes for you to complete.

There are no known risks associated with this research. There are also no known benefits directly to you that would result from your participation in this research. However, results of this research may benefit LCFB clients in the future.

We will do everything we can to protect your privacy. Please do not place your name or other identifying information on the survey. The survey process will take place in groups so once the survey is collected we will be unable to specifically link data to an individual.

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information

If you have any items or concerns about this study or if any problems arise, please contact Dr. Beth Kunkel at Clemson University at 864-656-5690. If you have any items or concerns about your rights as a research participant, please contact the Clemson University Institutional Review Board at 864.656.6460.

Appendix B: Pilot Informed Consent Letter for Telephone Interview

Information for Participation in a Research Study
Clemson University

Assessment of the value of nutrition education among Lowcoutry Food Bank Agency Directors

You are invited to participate in a research study conducted by Dr. Beth Kunkel along with Lucie Maguire. The purpose of this research is to further understand the value of nutrition education provided to Agency Directors of the Lowcountry Food Bank (LCFB).

Your participation will involve a telephone interview about your opinions of the nutrition education session held on March 16, 2011. This telephone conversation will take approximately 15 minutes for you to complete.

There are no known risks associated with this research. There are also no known benefits directly to you that would result from your participation in this research. However, results of this research may benefit LCFB clients in the future.

We will do everything we can to protect your privacy. The telephone conversations will not be recorded, and the notes taken will not reference a name.

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

Contact information

If you have any items or concerns about this study or if any problems arise, please contact Dr. Beth Kunkel at Clemson University at 864-656-5690. If you have any items or concerns about your rights as a research participant, please contact the Clemson University Institutional Review Board at 864.656.6460.

Appendix C: Nutrition Education Curriculum Outline

LOWCOUNTRY FOOD BANK

Agency Nutrition Education Training

Facilitator Curriculum

Facilitator Name:

Training Location:

Training Date:

Title: Selecting and Preparing Lowcountry Food Bank Foods in a Healthy and Flavorful Way
Objective:
Participants will increase their ability to help Lowcountry Food Bank clients select healthy, economical and flavorful foods.
Learning Questions:
By the end of the lesson, the participant will be able to answer the following questions: 1. What are the main food groups? 2. What is a balanced meal? 3. Why are serving sizes important? 4. What are the main numbers to read and apply on a food label? 5. How can one incorporate more fruits and vegetables throughout the day's meals? 6. Where can one get resources to share with clients?

Content Organizer

Food Groups and Balanced Meals
• Food groups using the MyPyramid • Choose at least 3 different food groups for each meal • A portion of most any food is the size of a cupped hand
Label Reading
• Explain the serving size information and how to use the serving size of a package • Explain the calories per serving and how to use the calories per serving to make decisions
Incorporating Fruits and Vegetables Throughout the Day
• Vegetable and fruit choices include fresh, frozen and canned • Using fruits and vegetables for breakfast • Using vegetables to extend the servings of a meal • Using vegetables in place of meat • Using fruits and vegetables in snack
Resources to Share with Clients

• Websites:
  ○ www.mypyramid.gov
  ○ http://allrecipes.com/
• Print:
  ○ Eat Well, Be Well – Lowcountry Food Bank
  ○ Loving Your Family, Feeding Their Future – available at the Lowcountry Food Bank for any agency

Narrative

The basic food groups using MyPyramid are Fruits, Vegetables, Grains, Meats and Beans and Dairy. The Fruits group includes fresh, frozen, canned and dried fruit. The Vegetables group includes fresh, frozen and canned vegetables and includes beans. The Grains group includes cereals, breads, rice, pasta, crackers and any other grain product. The Meats and Beans group includes protein sources, such as chicken, fish, meat, beans, peas, nuts and seeds. Beans are in both the Vegetables and Meats groups because they are a excellent plant source of protein. The Dairy group includes milk, yogurt and cheese. For each meal of the day, choose portions from at least 3 different food groups to achieve a balanced diet. When selecting portions of foods, remember that a portion of most any food, including proteins and grains, is about the size of what fits in your cupped hand.

The Nutrition Facts Panel, or the food label, is full of information. The most important information is the serving size and the calories. The serving size tells you how much of the food to which the rest of the information refers. It also tells you how many servings are in the package. This is important to consider, because if you intend to eat the whole package, you need to know how many servings that is. Considering how many servings of that food you plan to eat, you can determine how many calories you're eating of that food. The calories-per-serving is a useful value. Using the calories in the serving, you can determine how many calories of that food you plan to eat and apply that to the rest of your day's meals. Most healthy people should aim for 2000 calories total for the day. Putting these concepts together and considering a breakfast of cereal with milk and berries (3 food groups), take a look at the cereal box. A typical serving is ¾ of a cup and let's say 150 calories, but if you plan to have 1 ½ cups, then multiply the calories by 2 to get 300 calories. Add the cereal calories to the calories for the amount of milk and berries. This is roughly 450 calories for breakfast depending on the type of milk and cereal.

Choices of fruits and vegetables include fresh, frozen and canned products. Canned fruits and vegetables can be stored in your pantry for a year. Frozen fruits and vegetables are inexpensive and nutritious and can be frozen for as long as 8 months. Breakfast can easily incorporate fruits or vegetables. Consider frozen berries blended with milk and ice or fresh berries or banana over cereal. Vegetables pair nicely with eggs, such as an omelet with sautéed mushrooms, spinach and onions. Using vegetables in main dishes can extend the number of servings of the dish. Consider adding sautéed peppers, spinach (frozen) and onions to a chicken and rice dish. Incorporating vegetables like this will cut back on the cost of meat. Shred carrots or zucchini into meatloaf or casseroles. Beans can also easily be substituted for meat in a dish. They are hearty and a great source of protein. This is particularly useful in soups, rice dishes, tacos, and sandwiches. Fruits and vegetables can also be enjoyed for snacks. Fruits are nice with nuts or cheese. Salsa, black bean dip and hummus are easy and satisfying vegetable dips. Of course, you can always enjoy a handful of carrots and dip.

There are many resources available to help your clients. For nutrition information, such as details about the food groups and serving sizes, refer to www.mypyramid.gov. For a recipe search, you can use a website like http://allrecipes.com/ where you can search by recipe name or ingredient. The Lowcountry Food Bank has many resources available, including a Nutrition Library. Here you can find books and print materials for client use. Also, Eat Well, Be Well is published monthly aimed to assist clients with nutrition and food preparation. If you notice common questions from clients, please let the Nutrition Educator know so that topic can be incorporated into a future issue of Eat Well, Be Well.

Appendix D: Pilot Instrument: Pre- and Posttest

Agency Nutrition Education Curriculum
Pretest

Thank you for your time completing this survey. We hope to use this information to provide better nutrition education to the clients of the Lowcountry Food Bank

Please mark with an "X" your level of agreement with the following statements, where
1=Not at all true 2=Hardly true 3=Moderately true 4=Exactly true

Item	Question	Level of Agreement			
1	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2	If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
3	It is easy for me to stick to my aims and my goals.	1	2	3	4
4	I can explain the concept of food groups to a LCFB client.	1	2	3	4
5	I can explain what a balanced meal is to a LCFB client.	1	2	3	4
6	I am confident that I could deal efficiently with unexpected events.	1	2	3	4
7	I can suggest recipes to LCFB clients using pantry items as ingredients.	1	2	3	4
8	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
9	I can explain the concept of a serving size to a LCFB client.	1	2	3	4
10	I can explain to a LCFB client what a serving of protein looks like.	1	2	3	4
11	I can solve most problems if I invest the necessary effort.	1	2	3	4
12	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
13	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
14	I can explain the calories per serving on the Nutrition Facts Panel to an LCFB	1	2	3	4
15	If I am in trouble, I can usually think of a solution.	1	2	3	4
16	I can suggest ways LCFB clients can incorporate vegetables into their day's meals.	1	2	3	4
17	I can usually handle whatever comes my way.	1	2	3	4

Appendix E: Informed Consent Letter for General Survey

DATE

AGENCY ADDRESS

Dear NAME:

Dr. Angela Fraser and I are contacting a study of all Lowcountry Agency Directors. We need your help. We want to understand your perceptions about providing nutrition education to Lowcountry Food Bank clients. Providing nutrition education to clients is a goal of the Lowcountry Food Bank.

If you agree to help us, we will need you to complete the enclosed survey and return it to us in the self-addressed stamped envelope. We do not anticipate that it will take you more than 15 minutes to do so. The likelihood of harm or discomfort anticipated is no greater than what you would encounter in your daily life. However, the benefit of participating would be great. Your responses will help us to strategize how to achieve the goal of providing nutrition education to your clients.

Your responses will be kept strictly confidential. All data will be entered into an electronic database. Each survey will be assigned an identification number so your name or facility name is not connected to the data. All data will be stored securely and will be made available only to persons conducting the study. No reference will be made in oral or written reports that could link your responses to this study. All data will be destroyed at the end of the study.

If you have questions at any time about the study or procedures, contact Angela M. Fraser, Ph.D., 206 Poole Agriculture Center, Clemson University, Clemson, SC 29634 or 864.656.3652 You may also contact the Clemson University Office of Research Compliance at irb@clemson.edu, 864.656.6460, or toll-free at 866.297.3071 if you have questions about your rights as a research participant.

Your participation is voluntary. You do not have to participate if you do not want to do so. If you agree to help us, please complete the enclosed survey and return it to us by July 1, 2011. We really value the time that you are taking to help us.

Sincerely,

Lucie Maguire
M.S. Student
Department of Food, Nutrition, and Packaging Sciences
Clemson University

Appendix F: Instrument

Lowcountry Agency Directors Survey

1. What is your age? _____ years

2. What is your gender?
   - ☐ Male
   - ☐ Female

3. What is your highest level of education?
   - ☐ Some grade school
   - ☐ High school graduate
   - ☐ Some college
   - ☐ College graduate

4. How long have you worked with the Lowcountry Food Bank? _____ years

5. Do you have any formal training in nutrition?
   - ☐ Yes
   - ☐ No

   If you answered "yes", briefly describe.

6. Do you have direct interaction with Lowcountry Food Bank (LCFB) clients, such as face-to-face conversations?
   - ☐ Yes
   - ☐ No

Please mark with an **"X"** your level of agreement with the following statements, where:

1 = Not at all true; 2 = Hardly true; 3 = Moderately true; 4 = Exactly true

Item	Question	Your Level of Agreement			
1	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2	If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
3	It is easy for me to stick to my aims and my goals.	1	2	3	4
4	I can explain the concept of food groups to a LCFB client.	1	2	3	4
5	I can explain what a balanced meal is to a LCFB client.	1	2	3	4
6	I am confident that I could deal efficiently with unexpected events.	1	2	3	4
7	I can suggest recipes to LCFB clients using pantry items as ingredients.	1	2	3	4
8	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
9	I can explain the concept of a serving size to a LCFB client.	1	2	3	4
10	I can explain to a LCFB client what a serving of protein looks like.	1	2	3	4
11	I can solve most problems if I invest the necessary effort.	1	2	3	4
12	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
13	When I am confronted with a problem, I can usually find several solutions	1	2	3	4
14	I can explain the calories per serving on the Nutrition Facts Panel to an LCFB client.	1	2	3	4
15	If I am in trouble, I can usually think of a solution.	1	2	3	4
16	I can suggest ways LCFB clients can incorporate vegetables into their day's meals.	1	2	3	4
17	I can usually handle whatever comes my way.	1	2	3	4

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